

A NEW SPECIES OF *IXODES* PARASITIZING THE RICE RAT IN  
THE GALAPAGOS (IXODOIDEA: IXODIDAE)<sup>1</sup>

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*Abstract.*—*Ixodes (Ixodes) galapagoensis*, new species, is described from a nymph and from adults taken *in copulo* on the Rice Rat, *Oryzomys bauri* (Allen) (Cricetidae), on Barrington (=Santa Fe) Island, Galapagos. *Oryzomys* is one of the two surviving endemic land mammals of the Galapagos archipelago. No other species of the genus *Ixodes* are known from these islands.

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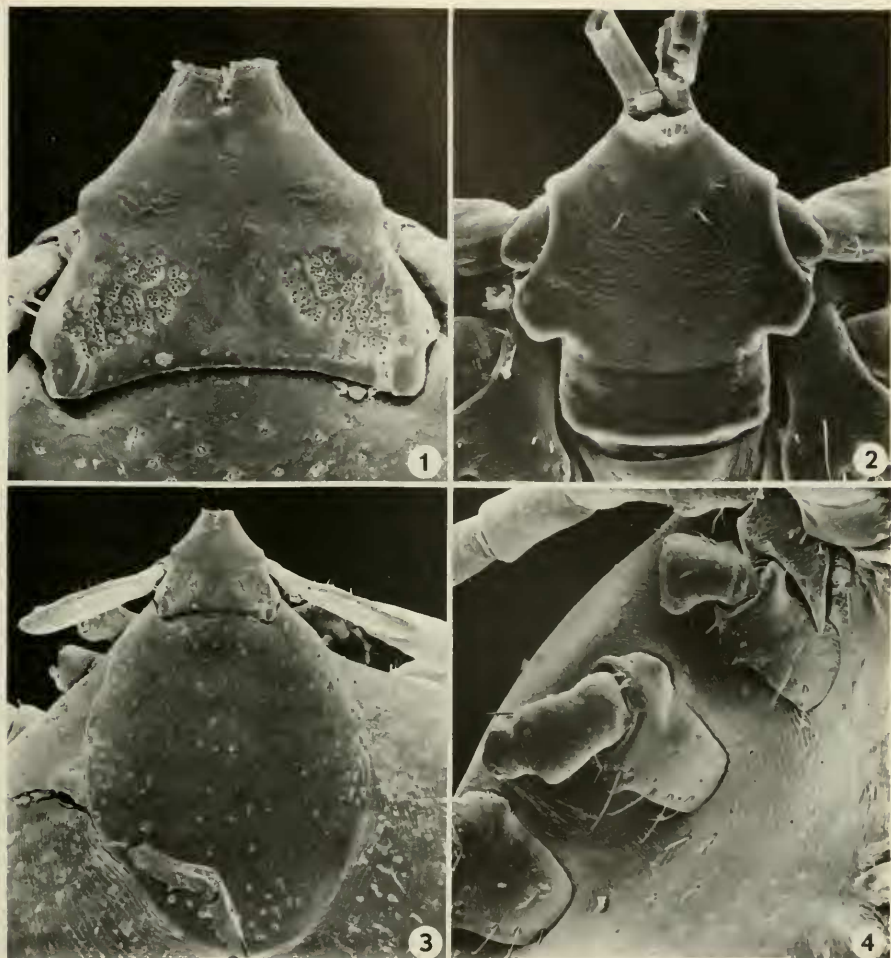
*Ixodes (Ixodes) galapagoensis* is described from a nymph and from an *in copulo* pair of adults taken from the Rice Rat, *Oryzomys bauri* (Allen) (Cricetidae), on Barrington (=Santa Fe) Island, Galapagos. This tick, related to some rare species from Mexico and Guatemala, is the only member of the genus *Ixodes* known to be present in the Galapagos Archipelago. Rice rats are the only land mammals endemic to the Galapagos, and only two species now survive. All measurements are in millimeters.

*Ixodes (Ixodes) galapagoensis* Clifford and Hoogstraal, NEW SPECIES  
Figs. 1-14

Female holotype (Figs. 1-4).—Partially engorged, 6.0 long (excluding capitulum); 3.7 broad. *Capitulum*: 0.33 long (from insertion of cheliceral digits to cornua apices), 0.38 broad. Basis capituli dorsally with porose areas large, diffuse, indistinctly demarcated, separated by distance about equalling

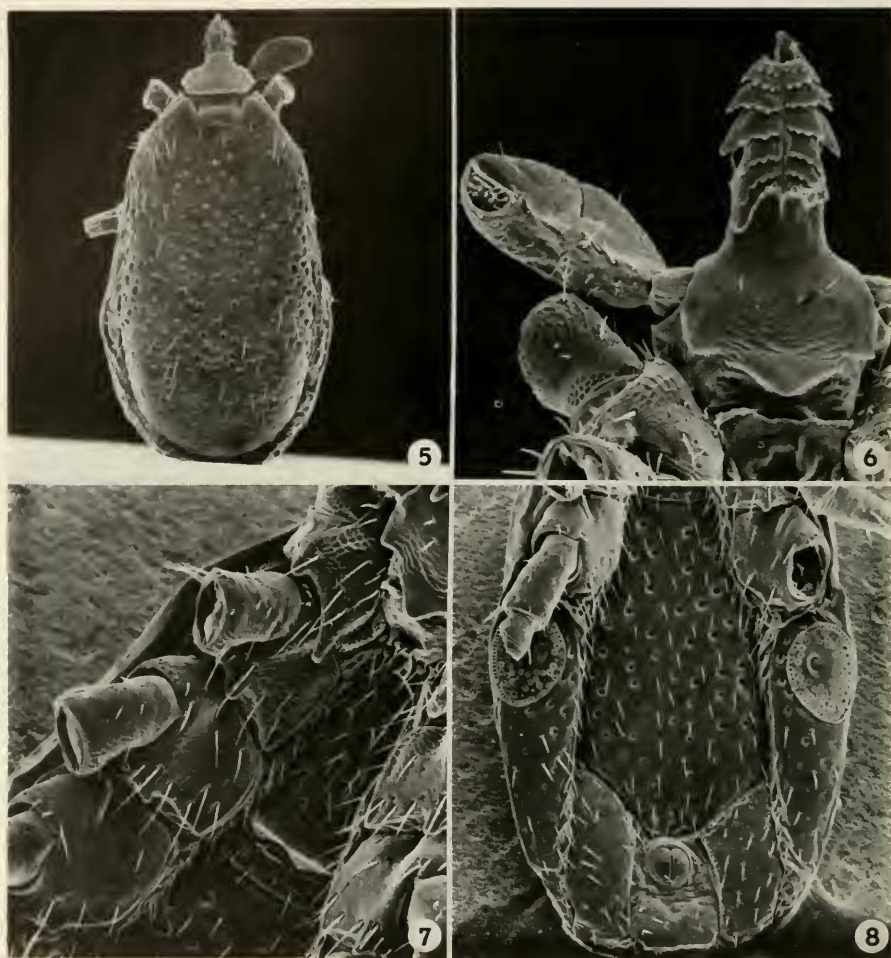
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Figs. 1-4. *Ixodes (Ixodes) galapagoensis*, holotype female. 1, Capitulum, 286 $\times$ . 2, Capitulum, ventral view, 288 $\times$ . 3, Scutum, 91 $\times$ . 4, Coxae I-IV, 130 $\times$ .

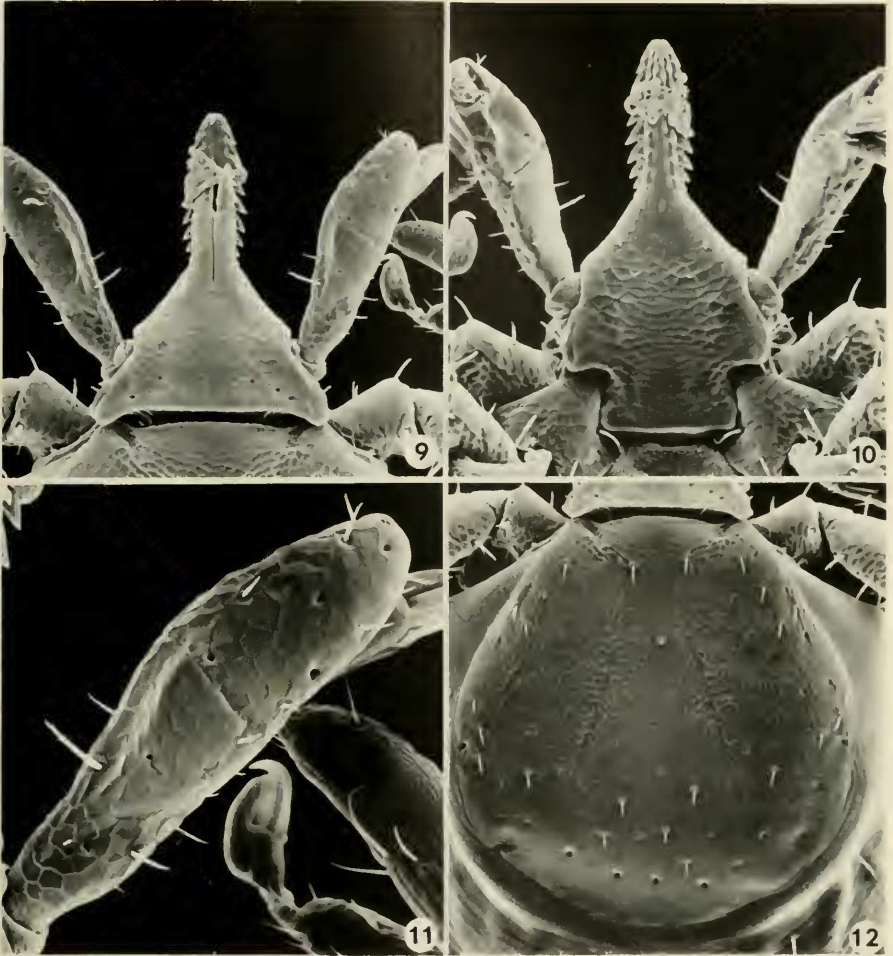
breadth of each area; posterior margin between cornua mildly concave; cornua as broad, slight marginal bulges. Basis capituli ventrally with large auriculae, knoblike, projecting posterolaterally; posterior margin broadly rounded; transverse suture present. Palpi 0.50 long, 0.15 broad; segments 2 and 3 combined length 0.45; segment 1 with small, bluntly rounded ventral protrusion. Hypostome missing. *Scutum*: 1.08 long, 0.88 broad; emargination shallow; scapulae blunt. Lateral carinae and cervical grooves lacking. Punctations as illustrated, mostly medium sized, larger posteriorly. Setae scattered, short. Spiracular plates subcircular; greatest diameter 0.33. *Gen-*



Figs. 5-8. *Ixodes (Ixodes) galapagoensis*, allotype male. 5, Body, dorsal view, 100 $\times$ . 6, Capitulum, ventral view, 234 $\times$ . 7, Coxae I-IV, 182 $\times$ . 8, Ventral plates, 104 $\times$ .

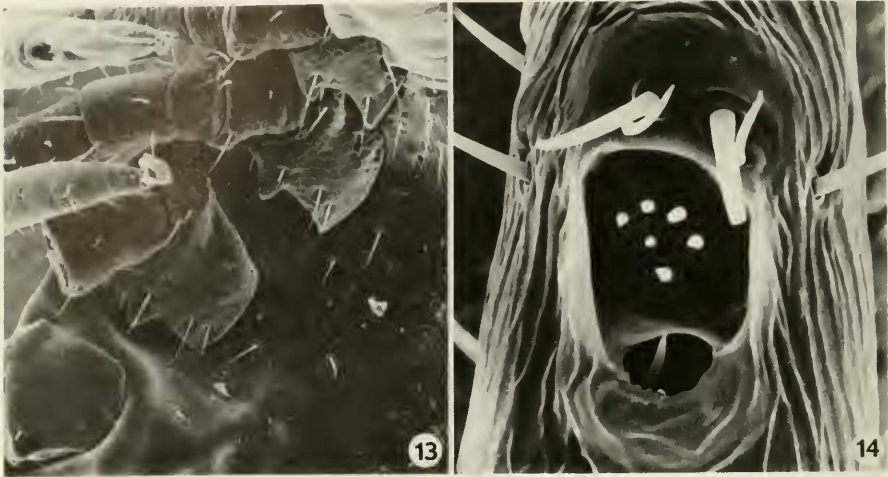
*ital and anal grooves*: Obscured due to engorgement. *Genital aperture*: Situated at level of coxae III. Legs size and length moderate. Coxa I internal spur elongately angular; external spur smaller, broadly triangular; II-IV each with external spur progressively smaller but distinct. Syncoxae areas lacking. Trochanters lacking spurs. Tarsus I length 0.58; metatarsus I 0.30; tarsus IV 0.53; metatarsus IV 0.38.

Male allotype (Figs. 5-8).—Length 1.58, breadth 0.85; outline oval; marginal fold narrow, irregular. *Capitulum*: 0.38 long (from palpal apices to



Figs. 9–12. *Ixodes (Ixodes) galapagoensis*, paratype nymph. 9, Capitulum, dorsal view, 250 $\times$ . 10, Capitulum, ventral view, 250 $\times$ . 11, Palp, dorsal view, 500 $\times$ . 12, Scutum, 200 $\times$ .

posterior margin of basis), 0.25 broad. Basis capituli dorsally with lateral margins diverging anteriorly to palpal insertions; posterior margin straight; cornua lacking. Basis capituli ventrally trilobed (as illustrated); posterior margin irregular. Palpi short, 0.25 long, 0.14 broad; broadly rounded apically; segments 2 and 3 lengths subequal. Hypostome short, 0.23 long; apically blunt, mildly concave; lateral denticles large, crenulations in transverse rows (as illustrated). *Scutum*: 1.50 long, 0.73 broad; outline as illustrated. Lateral carinae and cervical grooves lacking. Punctations mod-



Figs. 13-14. *Ixodes (Ixodes) galapagoensis*, paratype nymph. 13, Coxae I-IV, 260 $\times$ . 14, Haller's organ, 1750 $\times$ .

erately numerous, most medium sized, larger posteromedially and laterally. Setae moderately long, scattered chiefly posteriorly and laterally. *Ventral plates*: Outlines as illustrated, distinct. Setae short, rather regularly distributed on each plate. Punctations randomly distributed on each plate, mostly shallow, several larger and deeper laterally and anteriorly on median plate. *Spiracular plates*: Semicircular, greatest diameter 0.25. *Genital aperture*: Situated at level of coxae III. *Anal and genital grooves*: As illustrated. *Legs*: Coxae I internal spur elongate (apex blunted, ?damaged); external spur short, broadly subtriangular; II to IV each only with moderate sized external spur. Syncoxal areas lacking. Other leg segments missing.

Nymph paratype (Figs. 9-14).—Engorged, 1.90 long (excluding capitulum), 1.13 broad. *Capitulum*: 0.35 long (from hypostome apex to cornua apices), 0.23 broad. Basis capituli dorsally triangular, posterior margin between cornua straight; cornua peglike, projecting posterolaterally. Basis capituli ventrally with large auriculae, projecting laterally; margins constricted posterolaterally, straight posteriorly. Palpi 0.23 long, 0.63 broad; segments 2 and 3 lengths subequal, intersegmental suture distinct. Hypostome arising from triangular extension of basis; apex bluntly rounded (possibly slightly damaged); dental formula 3/3 to midlength, thence 2/2 to base. *Scutum*: 0.55 long, 0.53 broad; posteriorly broadly rounded. Lateral carinae lacking. Cervical grooves diverging, not reaching posterior margin. Punctations and setae more numerous peripherally than elsewhere. *Spiracular plates*: Subcircular, greatest diameter 0.10. *Legs*: Coxae I internal spur triangular,

moderate sized, external spurs slightly smaller; II and III external spur each distinct, triangular, internal spurs lacking (but posterointernal marginal junctures angular spurlike); IV external spur smaller, triangular. Coxal setae as illustrated. Tarsus I 0.33 long. Haller's organ anterior pit setae number 6.

Type material.—♀ (holotype) and ♂ (allotype) *in copulo* on Rice Rat, *Oryzomys bauri* (Allen) (Cricetidae), Barrington (=Santa Fe) Island (0°49'N, 90°04'W), Galapagos, 1975, D. and D. Clark (HH73,915), deposited in the Rocky Mountain Laboratory (RML105,755). Nymph (paratype), same host, locality, collectors, and depository, 25 February 1974 (HH73,758; RML64,636).

Species relationships.—*Ixodes (I.) galapagoensis* superficially resembles *I. tancitarius* Cooley and Kohls, 1942, *I. guatamalensis* Kohls, 1956, and *I. tamaulipias* Kohls and Clifford, 1966, each known only from one to three specimens from Mexico or Guatemala. The female of the new species is easily distinguished from these species in lacking lateral carinae and cervical grooves. *Ixodes (I.) guatamalensis* also lacks external spurs on coxae I and II; these are present in *I. (I.) galapagoensis*. The male and nymphal stage of few Neotropical *Ixodes* are known; therefore, a meaningful comparison of *I. (I.) galapagoensis* and other males and nymphs cannot be presented at this time.

Discussion.—Five of the seven oryzomine rodents once endemic in the Galapagos have become extinct since the introduction of *Rattus rattus* (David Clark, personal communication; Orr, 1966). *Oryzomys bauri* occurs only on Barrington (=Santa Fe) and *Nesoryzomys narboroughi* on Fernandia Island.

Finding the male and female *in copulo* indicates mating occurs on the host in the burrow-inhabiting *I. (I.) galapagoensis*. However, it should be scientifically valuable to learn more about the biology of this species, to determine whether this or other *Ixodes* ticks infest *N. narboroughi*, and to make an extensive comparative study of *Ixodes* ticks parasitizing oryzomine rodents in the Neotropical Faunal Region.

#### ACKNOWLEDGMENTS

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#### LITERATURE CITED

- Orr, R. T. 1966. Evolutionary aspects of the mammalian fauna of the Galápagos, pp. 276–281. In Bowman, R. I., ed. The Galápagos. (Proc. Symp. Galápagos Int. Sci. Project). University of California, Berkeley and Los Angeles.